

## Technical Bulletin #83:

# Integrated Pest Management – Insect Life Cycles

Insects have one of two life cycles: nymph or larval stages. The young or nymph life stage contains three life stages: egg, young and adult. In the larval stage insects pass through four life stages: egg, larva, pupa or cocoon and adult. Most insects have sexual reproduction and reproduce through eggs. Aphids, however, are an exception to this rule. Aphids do not reproduce sexually; all individuals are females and give birth to newly born aphids.

**Insects that are important in agriculture and have a three stage life cycle:** aphids, whiteflies, mealy bugs, leafhoppers, true bugs, grasshoppers, crickets, thrips and spider mites.

### Characteristics of the three stage life cycle and their implications for insect control:

1. The young and the adults look alike.
2. The young and the adults are found in the same place and eat the same food.
3. When controlled by insecticides only the young and the adults die. The larvae survive because they are hidden.
4. Re-infestation occurs due to the presence of surviving eggs and of new adults that fly back to the crop. Alternate hosts that maintain insect reproduction need to be controlled in order to achieve pest control.

#### Adult and young aphids

The egg stage takes place inside the female and the female gives birth to new aphids.



**True bug adult**



**True bug eggs**



**True bug young**

**Insects that are important in agriculture and have a four stage life cycle:** beetles (Coleoptera), caterpillars (butterfly or Lepidoptera larvae), fruit flies and leaf miners (Diptera or flies), bees, wasps and ants (Hymenoptera) and aphid lion (Neuroptera).

**Characteristics of the four stage life cycle and their implications for insect control:**

1. Larva and adult stages look different, feed on different food sources, and are found in different places.
2. When controlled using an insecticide only one stage is killed, two stages at most if a broad spectrum insecticide is used and the adult stage is present during application. Eggs and pupae escape control because they are hidden and do not feed.
3. Re-infestation occurs quickly because technicians and farmers usually aim at controlling only the larval stage and do not realize that adults, eggs, and pupae may be present in the field at the same time.
4. At least two life stages of the insect need to be controlled to achieve quick management of pest populations.
5. Alternate hosts need to be controlled in order to avoid re-infestation.



**Adult ladybeetle**



**Eggs**



**Ladybeetle larvae**



**Ladybeetle  
young**

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